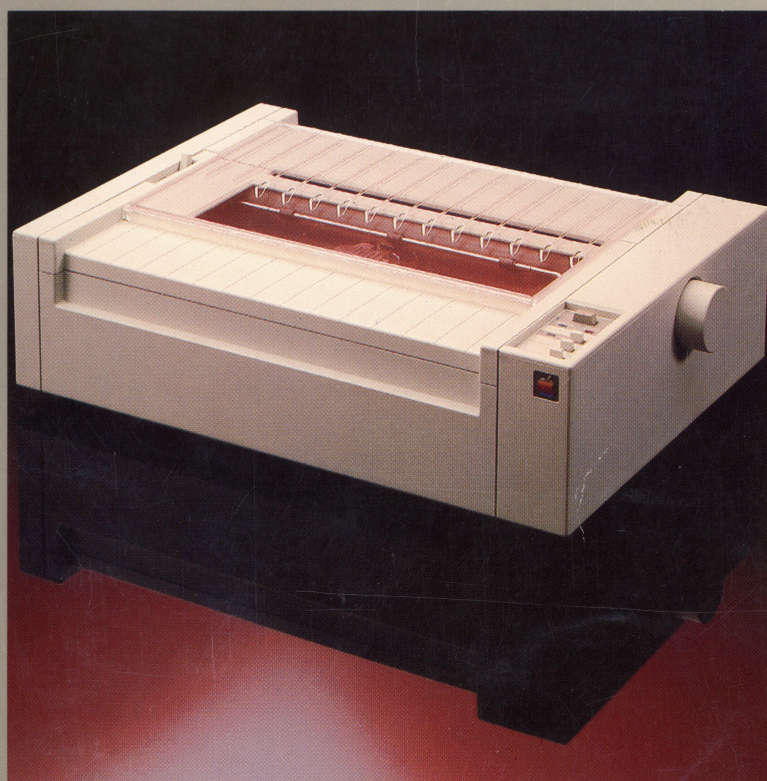


Apple II

Imagewriter User's Manual

Part II: Guide to Apple II



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The Imagewriter Tool Kit uses a machine language interface, and incorporates modules from "The Routine Machine" written by Peter Meyer and published by Southwestern Data Systems.

Product Revisions

Apple cannot guarantee that you will receive notice of a revision to the software described in this manual, even if you have returned a registration card received with the product. You should periodically check with your authorized Apple Dealer.

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Reorder Apple Product A2L0078

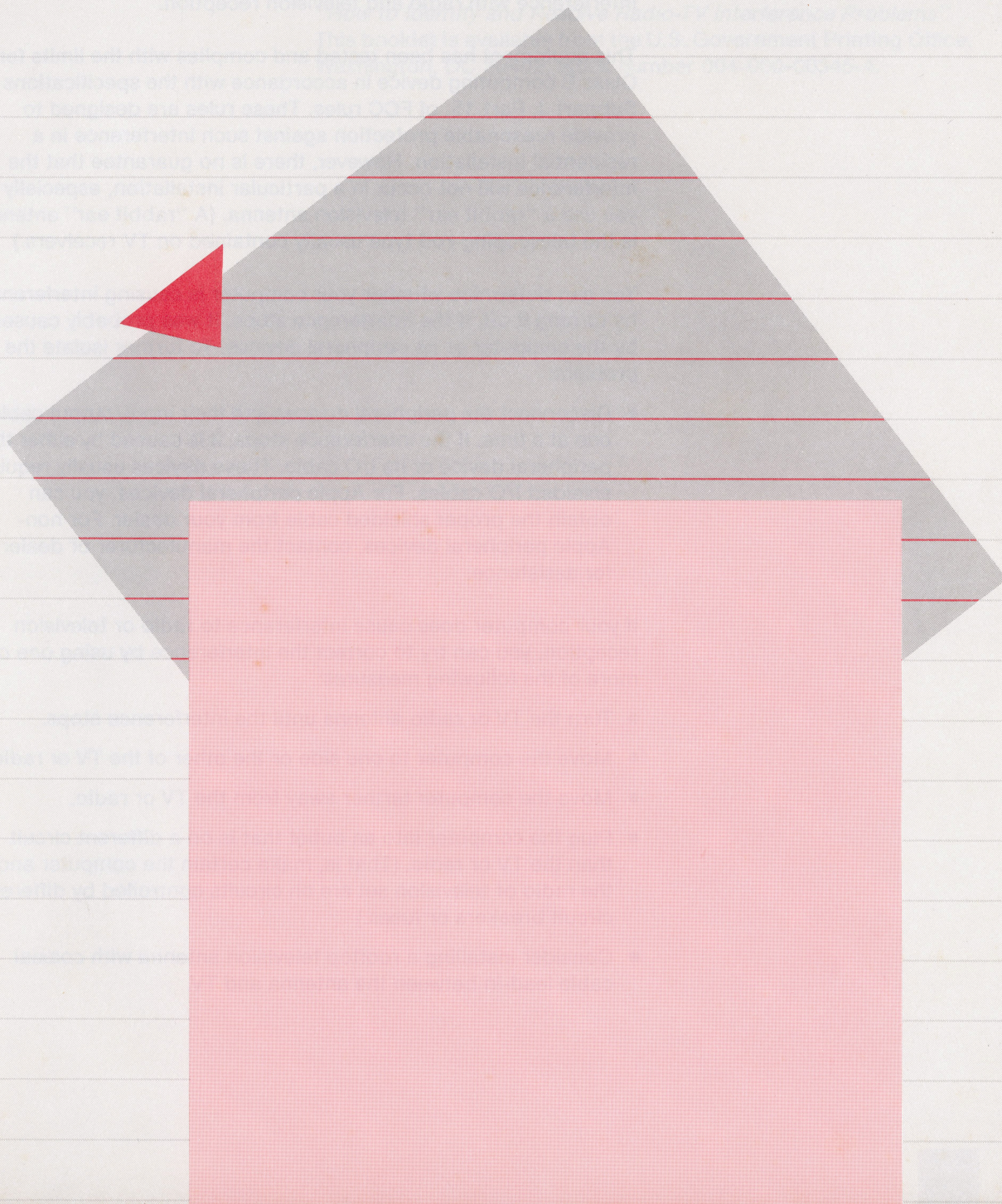
Warning

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

Apple //

Imagewriter User's Manual

Part II: Guide to Apple //



Radio and Television Interference

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception.

This equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J, Part 15, of FCC rules. These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation, especially if you use a "rabbit ear" television antenna. (A "rabbit ear" antenna is the telescoping-rod type usually contained on TV receivers.)

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or its peripheral devices. To further isolate the problem:

- Disconnect the peripheral devices and their input/output cables one at a time. If the interference stops, it is caused by either the peripheral device or its I/O cable. These devices usually require shielded I/O cables. For Apple peripheral devices, you can obtain the proper shielded cable from your dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.

If your computer does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

- Turn the TV or radio antenna until the interference stops.
- Move the computer to one side or the other of the TV or radio.
- Move the computer farther away from the TV or radio.
- Plug the computer into an outlet that is on a different circuit than the TV or radio. (That is, make certain the computer and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet, prepared by the Federal Communications Commission:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, stock number 004-000-00345-4.

Table of Contents

	List of Figures and Tables	vii
	Preface	ix
	ix What Imagewriter Can Do	
	ix How to Use This Manual	
1	Installing the Serial Interface	1
	1 Using a Super Serial Card	
	3 Using an Apple II Communications Card	
	4 Using an Apple II Serial Interface Card	
2	Printing From Programs	7
	7 Printing From Applesoft	
	8 Printing From Pascal	
	8 Printing Text Files From Disk	
	8 Printing Keyboard Input	
	9 Programming Examples	
	10 Using Script II	
	10 Printing From Apple Writer II	
	12 Printing From Visicalc®	
3	Imagewriter Utilities	15
	15 The HEXCODE Program	
	16 Why You Need HEXCODE	
	16 Using HEXCODE	
	17 Creating HEXCODE (Pascal Version)	
	18 HEXCODE Listing (Pascal Version)	
	20 Creating HEXCODE (Applesoft Version)	
	20 HEXCODE Listing (Applesoft Version)	
	22 Imagewriter Tool Kit Disk	

List of Figures and Tables

- 2** Figure 1-1. Super Serial Card.
- 3** Figure 1-2. Apple II/IIe Serial Interface Connectors.
- 10** Table 2-1. Nonprinting ASCII Character Codes.
- 25** Table 3-1. Superscript and Subscript Character

Preface

Welcome to Part II of the *Apple Imagewriter User's Manual*. This part of the manual tells you how to connect your new Imagewriter to your Apple II computer and how to use the printer with several languages and software products.

What Imagewriter Can Do

The Apple Imagewriter can do more than just print text. Given the proper commands, it can underline text, print in boldface, output graphics, or mix more than one typeface in a given document.

These functions are possible because you can send commands to the printer along with the text to be printed. A file that contains commands sent to the Imagewriter is called a **command file**.

If you consider the characters sent by a program like Apple Writer as commands for the Imagewriter to perform (in this case to print text) any text file sent to the printer could be defined as a command file.

You can even send a special file, called a **format file**, that doesn't print anything at all, but sets up your printer for a special job. For example, a format file could contain commands to set character spacing, tab columns, and vertical spacing as required for a particular business form or report. This could save you much time in formatting a form, report, or table that you print daily.

How to Use This Manual

Read Chapter 1 of this part of the manual to find out how to connect your printer to your Apple II.

Next, if you haven't already done so, read Chapters 1 through 3 of Part I and make sure that your printer is set up and ready to run.

Then come back to Chapters 2 and 3 of Part II. Chapter 2 tells how to use the Imagewriter with several common programs. Chapter 3 describes two Imagewriter utilities: HEXCODE, a program that helps you use the special text features of your Imagewriter, and the Imagewriter Tool Kit, a program whose main purpose is to allow you to print Apple II high-resolution graphics files.

If you are a programmer, you will want to examine the programming examples in Chapter 3 of Part II.

Two types of visual cues appear in this manual:



Warning

Warning boxes like this direct your attention to something that could damage either software or hardware.

Note: Gray boxes like this one are used for information which is useful, but not essential for understanding the main text.



Warning

This equipment is intended to be electrically grounded.

This product is equipped with a three-prong power cord. As a safety feature, the plug is designed to fit only into a polarized, grounded three-hole outlet. If you don't have such an outlet, have a licensed electrician install one (and a grounding conductor, if necessary) where you will use the computer. Do not defeat the purpose of the grounded plug.

Installing the Serial Interface

To use your Imagewriter, you will need to install a serial interface card in your Apple II. There are three Apple products for this purpose: the Super Serial Card, the Apple II Communications Card, and the Apple II Serial Interface Card. The Super Serial Card is the interface card you will most likely be using. Installation of each of the three cards is described below.

If you are using one of these cards, refer both to the sections below that describe your card and to the card's reference manual. If you are using a serial interface card made by another manufacturer, refer to its reference manual, and also read through this chapter for information that you might need.



Warning

Before you install any card in your Apple II, be sure the computer is turned *off*. You could damage your computer if the power is on.

Note: Switch SW1-5 is set to the open position at the factory. Change the setting from the open to the closed position to enable the printer to recognize "high-ASCII" characters. (See Chapter 4 in Part I of this manual for switch location and setting, and Appendix C for a listing of "high-ASCII" characters.)

Using a Super Serial Card

You will usually set up your Super Serial Card for the following configuration when using your Apple Imagewriter:

- 9600 baud data transmission rate
- 8-bit (one stop bit) data format
- no parity
- line feed after carriage return enabled

- interrupts off
- no delays set
- connector signals set for TERMINAL (not MODEM!) operation

The configuration given above allows graphics output as well as regular text. See the section “Imagewriter Tool Kit Disk” in Chapter 3 for information on printing graphics.

If you plan to use the standard configuration, set the DIP switches on the card as shown in Figure 1-1. If you want to use a different configuration, refer to Chapter 2 of the *Super Serial Card Installation and Operating Manual* for the required switch settings. (If you are using the Reference Card, be sure you are looking at the side for *printers*, not *communications*.)

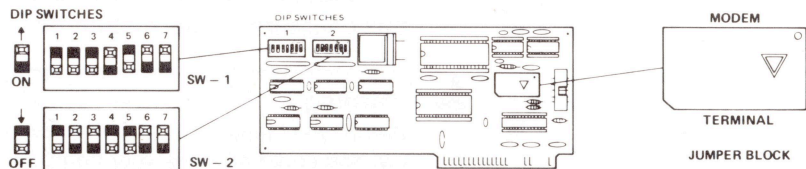
A Reminder: For all switch settings on the card:

open = OFF

closed = ON

Figure 1-1. Super Serial Card

SW1: OFF OFF OFF ON OFF ON ON
SW2: ON OFF OFF ON ON OFF OFF



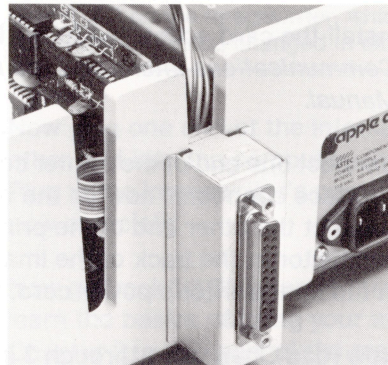
Be sure to install the jumper block, also shown in Figure 1-1, so that its arrow is pointing toward the word **TERMINAL**. If it is pointing to **MODEM**, your printer won't print.

If you do use a different data transmission speed, don't forget to set the Imagewriter to match the Super Serial Card. In any case, always set switch 1-5 on the Super Serial Card to OFF. If this is not done, you will have trouble printing under DOS 3.3. (See Chapter 4 in Part I of this manual for information about setting the Imagewriter's switches.)

Now, if you haven't already done so, install the Super Serial Card in slot 1 of your Apple II. The Super Serial Card manual tells you how to do this.

Now connect the printer's interface cable to the 25-pin serial interface connector that is now showing through the back panel of your Apple II. (Refer to Figure 1-2.) Then connect the other end of the printer interface cable to the DB-25 connector at the back of the Imagewriter. Once you have plugged in the Imagewriter's power card, the installation is complete.

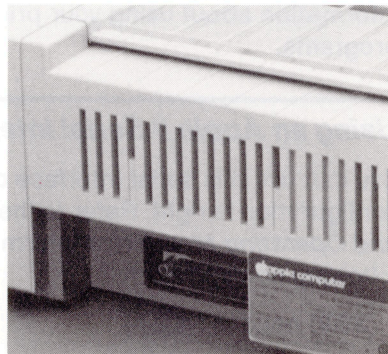
Figure 1-2. Apple II/Ile Serial Interface Connectors



Apple II



Apple II e



Imagewriter

Apple II
Serial Interface Connector
Interface Cable
DB-25 Connector
Imagewriter

Now read Chapters 1 through 3 in Part I of this manual to learn the basics of using your new printer. Then come back to Chapter 2 in this part of the manual for information about using your printer with different languages and programs.

Using an Apple II Communications Card

You can use this older model serial interface card to drive your printer, but you must make these changes in the system's configuration:

- Data transmission (baud) rate of the Imagewriter must be 300 baud, not 9600.

- Interface signals sent by the printer card must be configured for TERMINAL, not MODEM.

Because the Communications Card operates at 300 baud, you will have to change the Imagewriter's data input speed from 9600 to 300 baud. (See Chapter 4 in Part I of this manual for information about setting the Imagewriter's switches.)

Install the card according to the instructions in the *Communications Interface Card Installation and Operating Manual*.

Connect one end of the printer connector cable to the 25-pin serial interface connector now on the back of your Apple II. Then connect the other end of the printer interface cable to the DB-25 connector at the back of the Imagewriter. Once you have plugged in the Imagewriter's power cord, the installation will be complete.

Now read Chapters 1 through 3 in Part I of this manual to learn the basics of using your new printer. Then come back to Chapter 2 for information about using your printer with different languages and programs.

Using an Apple II Serial Interface Card

You can use this serial interface card, but make sure the configuration is right. Refer to the *Serial Interface Card Installation and Operating Manual* for information on how to set up the following configuration:

- 9600 baud
- 8-bit, no parity data format
- zero delay for carriage return
- zero delay for line feed
- zero delay for form feed

A Reminder:

For all switch settings on the card:

open = OFF

closed = ON



Warning

One of the ROMs on the Serial Interface Card is labeled either P8 or P8A. If it is P8, you must transfer data to the printer at 300 baud. (See Chapter 4 in Part I of this manual for information on setting the printer switches to the correct baud rate.)

If the ROM is a P8A, the normal transmission rate of 9600 baud is fine.

Switch 2-3 on the Imagewriter, which sets the communication protocol, does not need to be changed in either case.

Now plug one end of the interface cable into the printer and the other end into the computer. *Do not* use the modem eliminator. Plug in the Imagewriter's power cord; installation of your printer is now complete.

Now go back to Chapters 1 through 3 in Part I of this manual to learn the basics of using your new printer. Then come back to Chapter 2 in this part of the manual for information about using your printer with different languages and programs.

Printing From Programs

This chapter tells you how to use your Imagewriter with Applesoft and with Pascal. It also gives examples of how to print text from Script II, Apple Writer II, and VisiCalc®.

You don't need to read the sections covering languages or products you don't have. If you're using a program or language that isn't discussed here, refer to that product's documentation on how to use a printer.

Printing From Applesoft

Refer to your *Applesoft BASIC Programmer's Reference Manual* for more information on the PR# and PRINT commands.

You use Applesoft's PRINT command to print text. Normally, Applesoft assumes that you want to send data to your video monitor or television set. The PR# statement lets you direct output either to the monitor screen or to any of the expansion slots. The following program assumes that your serial interface card (of whatever type) is plugged into slot 1:

```
110 PR# 1 :REM Sends text to printer
120 PRINT "This is a test."
130 PR# 0 :REM Text to screen again
```

If you are using a different slot, substitute the correct slot number after PR# in line 110. Be sure to reassign output to the monitor screen (using PR# 0) when your program has finished sending characters to the printer.



Warning

Be careful! If you are sending text to the printer and to the screen at the same time, and if you are printing lines longer than 40 characters in length, your Applesoft program will be damaged by having program statements replaced by what you are printing.

This is because the Apple II's text screen is placed in memory just below the beginning of the Applesoft program that is currently running. If you have set the output line length to be greater than 40 characters, the extra characters will be sent not to the screen, but to the beginning of your program. If this happens, operation of your program will be unpredictable at best.

Printing From Pascal

You can use the Imagewriter with an Apple II Pascal system in a number of different ways.

Printing Text Files From Disk

You can print a disk text file by using the Pascal Filer's Transfer command, like this:

Prompt: Transfer what file?

Response: <filename>

Prompt: To what file?

Response: PRINTER:

Printing Keyboard Input

You can use the Filer to send text that you type directly to your printer by using the Transfer command like this:

Prompt: Transfer what file?

Response: console:,printer:

Whatever you type will appear on the Apple's display screen, until you press **(CONTROL)-(C)**; then all that you have typed will be sent to the printer. You can include Imagewriter command codes in the text that you type (for example to produce underlined or boldface text), as long as you do not use any printer control code that includes **(CONTROL)-(C)**.

Programming Examples

Here is an example of a Pascal program that sends characters to the printer:

```
PROGRAM Printer; {A trivial program, but it works!}

VAR Pntr:TEXT;

BEGIN
    REWRITE(Pntr,'PRINTER:'); {Open a file for use. In this case,
                                Pascal's predefined printer slot.}
    WRITELN(Pntr,'This is a test. '); {Send characters to the file.}
    CLOSE(Pntr); {Close the file.}
END.
```

For more information on Pascal file and device use, see the *Apple II Pascal Language Reference Manual*. The Pascal Filer is described in the *Apple II Pascal Operating System Reference Manual*.

Note that all input and output (I/O) in Pascal programs is through files. The Pascal system predefines slot 1 as belonging to the system printer, called "PRINTER:". If "pntr", or some other filename previously defined as referring to "PRINTER:", had not been included in the WRITELN statement, Pascal would have sent the text to your monitor.

The following simple Pascal program can be used to transfer characters from the keyboard to the printer on a line-by-line basis, allowing you, in effect, to use your printer as a typewriter. Press **CONTROL-C** to exit the program.

```
PROGRAM Typewriter;

VAR   pntr:TEXT;
      buff:STRING;

BEGIN
    REWRITE(pntr,'PRINTER:');
    WRITELN('Keyboard to Printer transfer - <ctrlC> to exit!');
    WHILE NOT EOF DO
        BEGIN
            READLN(buff);
            WRITELN(pntr,buff)
        END;
    CLOSE(pntr)
END.
```

Note the Difference: When you use the Transfer command of the Filer to type directly to the printer, the text is *not* sent to the printer line-by-line; it is printed only after you type the end of file character, **CONTROL-C**.

You can print text files prepared with Apple Writer by following these steps:

[P] means to press **CONTROL**-(P).

1. To get the Print Command Menu, press [P] and type ?. Then set the Print/program format options you desire. Make sure you set carriage return (CR) to 1, unless you want double-spaced documents.
2. To erase memory, press [N] and type Y in response to the prompt.
3. To load the first file, press [L] and type the name of the file in response to the **CLoad** prompt.
4. To start printing, press [P] and type NP (the New Print command).
5. When printing stops, erase memory. (See step 2)
6. To load the next file, press [L] and type the name of the file.
7. To continue printing, press [P] and type CP (the Continue Print command).
8. Repeat steps 5 through 7 as required.

See the *Apple Writer II* manual for more information about using Apple Writer II.

Printing From Visicalc®

This section gives you basic information for printing VisiCalc® worksheets with your Imagewriter. For more details and background information, please see the section in your VisiCalc® manual that has instructions for using a Qume printer. Most of this information applies to the Imagewriter as well.



Warning

Make sure that your serial interface card is in slot 1 of your Apple II. VisiCalc® assumes that the printer interface card is there. If the card isn't there, VisiCalc® will stop working when you try to print.

You may print all or any part of your VisiCalc® electronic worksheet by following these steps:

1. Position the cursor at the upper left corner of the part of the sheet you wish to print.
2. Type /P to select the Print option. The prompt line should then read:

Print: Printer, File name

3. Type P to send output to the printer. The prompt line should read:

Print: Lower right or "setup

Now move the cursor to the lower right corner of the portion of the sheet you wish to print (or just enter the coordinates), then press

RETURN.

Note: The printer does not need either an initial carriage return or special setup characters. While you can give special commands when you begin printing your worksheet, use of the "setup command is not needed.

Imagewriter Utilities

Many programming languages and applications that you use with your Apple II allow you to use your Imagewriter, but few (if any) of them let you use all of its features. This is because it would be very difficult to write a program that could anticipate the requirements and capabilities of all the different types of printers that you might use.

This chapter describes two tools that can help you get the most out of your Imagewriter:

- **HEXCODE**, a program that makes it possible to use all of the printer control codes in text files
- the **Imagewriter Tool Kit**, with which you can print high-resolution graphics pictures.

Listings for **HEXCODE** are given here (in both Pascal and Applesoft) so that you can add it to your own library of utility programs. In order to add the program to your library, it will be helpful if you know a little bit about programming. But if you don't, don't worry. Follow the instructions given here carefully, and refer to your Applesoft or Pascal manuals if you need more help. Once you have a working program on disk, using the program is easy.

The **Imagewriter Tool Kit** is on the **Imagewriter Tool Kit** disk, all ready for you to use.

The HEXCODE Program

HEXCODE is a text-processing program that you use to translate hexadecimal ASCII codes in your text files into control codes that the printer understands.

The hexadecimal values of Imagewriter control codes can be found in Appendix B in Part I of this manual.

Why You Need HEXCODE

But why are the hexadecimal ASCII codes in your files in the first place? To use all the features of your Apple Imagewriter, you must be able to send it any of its control codes. But to embed control codes in a text file occasionally turns out to be difficult; either the control code you need can't be entered directly from the Apple II's keyboard, or else it may produce undesirable side effects in a program that you are using.

The easiest way to handle an "illegal" control code is to enter it in your text file as the equivalent hexadecimal ASCII code. You then need a program that translates the ASCII code back to the printer control code. This is where HEXCODE comes in.

Most text goes through HEXCODE unchanged, but whenever a flag character appears in the input, HEXCODE tries to interpret the two characters immediately following it as a hexadecimal number between \$0 and \$FF (0 to 255). The flag character and the two-digit number following it are replaced by a single ASCII character in the output file. The flag character is normally a dollar sign, but you can change it.

For example, to place an ASCII Escape character in your text you can enter a dollar sign and the hex value for Escape: \$1B. When you process the result with HEXCODE, the sequence \$1B will be automatically replaced by the ASCII Escape character in the output file.

Using HEXCODE

HEXCODE can handle text in four different ways:

- Send characters directly from the keyboard to the printer;
- Send characters from the keyboard to a disk file;
- Send the contents of a disk file to the printer;
- Transfer the contents of one file to another.

HEXCODE first asks you for the name of the input file. If you want HEXCODE to process a disk file, type the name of the file and press **(RETURN)**. If you want to process keyboard input, type **K** and press **(RETURN)**.

Next, HEXCODE asks where to send its text output. You should respond either by typing the name of a disk file (and pressing **(RETURN)**) or by typing **P** (and pressing **(RETURN)**) if you want to use the printer.

If the files you have specified can't be found or opened, HEXCODE will stop running. Misspelling the filename or referring to the wrong disk might cause this problem. You will have to identify and correct the problem before restarting HEXCODE and going on. (The versions of HEXCODE provided here have no error handling routines, but they could be added.)

Finally, HEXCODE asks whether you want to discard the eighth bit. Answer "no" by typing **N** or **n**. You actually do want the eighth bit to be ignored, but the Imagewriter is already set to do so.

After you have answered this last question, HEXCODE will (depending on your responses to the questions) either perform the disk file operations you requested, or wait for you to start typing at the keyboard.

If you are typing at the keyboard, the text will appear only on the display until you press **(RETURN)** to send the line of text to HEXCODE. You can edit each line on the display, before you send it to HEXCODE, by using the cursor motion keys. To end keyboard entry, press **(CONTROL)-(C)**.

Here are some points to remember about HEXCODE's operation:

- If you need to place the hex flag character in your input as a text character (not as the start of a hex digit pair), you should enter its hex equivalent. For example, \$24 in the input is translated to \$ in the output (24 is the hex code for the \$ character).
- HEXCODE allows you to include nonprinting ASCII characters, as well as characters not produced by the Apple II keyboard, in Integer BASIC programs. This technique requires that you maintain separate text and program files when using Integer BASIC, but it compensates for the lack of a CHR\$ function in the language. Although you could do the same with Applesoft or Pascal programs, it is probably easier to use the CHR\$ (or CHR) function.

Program listings for HEXCODE in both Pascal and Applesoft are given in the following sections.

Creating HEXCODE (Pascal Version)

See the *Apple Pascal Operating System Manual* for more information about using Apple II Pascal.

Follow the procedure given below to add HEXCODE to your library of Pascal utility programs.

1. Use the Pascal System Editor to create a copy of the program listing in the file SYSTEM.WRK.TEXT. Remember, although Pascal is quite forgiving about spaces, indentation, and line spacing, it is very critical about punctuation. Comments occurring between curly brackets like this are only explanatory and not required by the program, but if you ever want to make changes in the program, they will be very helpful.

Changing the Flag: If you want to use a character other than \$ to flag hex digit entries for HEXCODE, just change the variable assignment in program line 2 (hexflag). (You might want to add a procedure to the program to have the program ask you for your current choice of hex flag character.)

2. After you have finished typing in the program from the listing, exit the Editor and type `C` to compile your program file. The compiler will cheerfully inform you of any typing errors that you have made. Keep trying!
3. When you have successfully compiled HEXCODE, use the Pascal Filer's Save command to save your text and code files on both a backup disk and the disk that you generally use when processing text files. Now whenever you want to use HEXCODE, execute the code file that you saved above, just as you would any other Pascal program. (If you put the HEXCODE code file on a Pascal startup disk and name the file SYSTEM.STARTUP, it will automatically be executed at startup.)

HEXCODE Listing (Pascal Version)

```
PROGRAM Hexcode;

CONST  hexflag = '$';           {Establish flag character}
       hex = '123456789ABCDEF'; {Define hexadecimal digits}

VAR    infile, outfile : TEXT;
       buff1, buff2 : STRING;
       place, digit, value, bit8 : INTEGER;
       kbd : BOOLEAN;

BEGIN                                     {Begin main program}
  kbd := FALSE;                          {Initialize keyboard input flag}

  {Display title and prompts}
  WRITELN('*** CONVERT HEXADECIMAL TO ASCII ***');
  WRITELN;
  WRITE('Input (Filename or K for Keyboard): ');
  READLN(buff1);
  WRITE('Output (Filename or P for Printer): ');
  READLN(buff2);
```

```

IF (buff2 = 'P') OR (buff2 = 'p') THEN buff2 := 'PRINTER: ';
REWRITE(outfile,buff2);           {Open output file or printer}
WRITE(CHR(13),'Discard 8th bit? (Y for yes): ');
READLN(buff2);
WRITELN;
IF (buff2 = 'Y') OR (buff2 = 'y') THEN bit8 := 128 ELSE bit8 := 0;

    {Use built-in file INPUT for keyboard, or open input file}
IF (buff1 = 'K') OR (buff1 = 'k') THEN kbd := TRUE ELSE
    RESET(infile,buff1);

buff2 := '0';           {Establish 1-char length for buff2}

    {When using keyboard, exit from loop with Control-C}
WHILE (kbd AND NOT EOF) OR (NOT EOF(infile)) DO
    BEGIN               {Begin main loop}

        {Fetch string from keyboard or input file}
        IF kbd THEN READLN(buff1) ELSE READLN(infile,buff1);
        digit := 0;     {Reset digit counter}

        {Examine characters in string}
        FOR place := 1 TO LENGTH(buff1) DO
            BEGIN       {Strip out 8th bit if requested}
                IF ORD(buff1[place]) > 127 THEN
                    buff2[1] := CHR(ORD(buff1[place]) - bit8) ELSE
                    buff2[1] := buff1[place];

                {If it's the hexflag, set digit counter and go on}
                IF buff2[1] = hexflag THEN digit := 2 ELSE

                    IF digit = 2 THEN
                        BEGIN
                            value := POS(buff2,hex) * 16;
                            digit := digit - 1;
                        END;

                    ELSE IF digit = 1 THEN
                        BEGIN
                            value := value + POS(buff2,hex);
                            WRITE(outfile,CHR(value));
                            digit := digit - 1;
                        END;

                    ELSE IF digit = 0 THEN
                        BEGIN
                            value := value + POS(buff2,hex);
                            WRITE(outfile,buff2[1]);
                        END;

                    END;           {End else}
                END;           {End else}

            END;           {End else}

        END;           {End else}
    END;

```


END;	{End for .. do}
WRITELN(outfile);	{Send end-of-line to output}
END;	{End of main loop}
CLOSE(infile);	{Close input and output}
CLOSE(outfile,LOCK);	
END.	{End of program}

Creating HEXCODE (Applesoft Version)

HEXCODE can be run in Applesoft BASIC but not in Integer BASIC, because that language lacks a CHR\$ function.

To add the Applesoft version of HEXCODE to your library of utility programs for use with the printer, follow this procedure:

1. Carefully type the program listing given below, following all the punctuation and line numbers exactly. The lines that begin with REM are explanatory comments, and may be omitted. Errors will be pointed out to you either as you enter each line, or when you try to run the program.
2. When you have finished typing in the program, type SAVE HEXCODE to store it on a disk.

Now whenever you want to use HEXCODE, just type RUN HEXCODE.

HEXCODE Listing (Applesoft Version)

```

10  REM PROGRAM HEXCODE. TAKES INPUT FROM EITHER THE KEYBOARD OR A
    TEXT FILE AND OUTPUTS TO THE PRINTER. IF THE CHARACTER
    IS A "$", THEN THE NEXT TWO CHARACTERS FOLLOWING THE $ ARE
    CONVERTED TO HEXADECIMAL AND OUTPUT TO THE PRINTER AS A
    SINGLE VALUE.

15  REM INITIALIZE VARIABLES
20  HXFLAG$ = "$"
30  HEX$ = "123456789ABCDEF";D$ = CHR$(4)

35  REM DISPLAY PROMPTS AND GET INFORMATION FROM USER
40  TEXT ; HOME ; PRINT "*** CONVERT HEXIDEcimal TO ASCII ***"
50  PRINT ; PRINT ; PRINT ; PRINT "INPUT (FILENAME OR K): INPUT "    FOR
    KEYBOARD); ";A$
60  PRINT ; PRINT ; PRINT "OUTPUT (FILENAME OR P): INPUT "          FOR
    PRINTER); ";B$
70  IF B$ = "P" THEN OUTFILE$ = "PRINTER"
80  IF A$ < > "K" THEN INFILE$ = A$; GOTO 90
85  INFILE$ = "KEYBOARD"
90  PRINT ; PRINT ; INPUT "DISCARD THE 8TH BIT? (Y/N) ";A$
100 IF A$ = "Y" THEN BIT8$ = 128; GOTO 120
110 BIT8$ = 0

```

```

115 REM SETUP ERROR DETECTION FOR END OF FILE
120 ONERR GOTO 500
125 REM GET THE INPUT FROM THE FILE OR FROM THE KEYBOARD
130 IF INFILE# < > "KEYBOARD" THEN GOSUB 700
140 INPUT A$
143 B$="0";REM SET B$ = "0" IN CASE RETURN IS PRESSED WITH NO
      VALUE IN A$.

145 REM CHECK EACH CHARACTER IN THE INPUT STRING: A$
150 DIGIT% = 0
160 FOR PLACE = 1 TO LEN (A$)
170 IF ASC ( MID$ (A$,PLACE,1)) > 127 THEN B$ = CHR$ ( ASC ( MID$
      (A$,PLACE,1)) - 128%); GOTO 190
180 B$ = MID$ (A$,PLACE,1)
190 IF B$ = HXFLAG$ THEN DIGIT% = 2; GOTO 210
200 GOSUB 300;DIGIT% = DIGIT% + 1
210 NEXT PLACE

215 REM CHECK TO SEE IF THE OUTPUT IS TO THE PRINTER OR TO THE CONSOLE
220 IF OUTFILE$ = "PRINTER" THEN PR# 1; PRINT ; PR# 0
230 IF OUTFILE$ < > "PRINTER" THEN PRINT
240 GOTO 140

300 REM IF DIGIT% IS 2 OR 1, THEN CONVERT THE NEXT TWO CHARACTERS TO
      ITS HEXADECIMAL VALUE AND SEND IT TO THE OUTFILE$.
305 IF DIGIT% = 2 THEN GOSUB 600;HEXVLU = VALUE% * 16
310 IF DIGIT% = 1 THEN GOSUB 600;HEXVLU = VALUE% + HEXVLU; IF OUTFILE$ =
      "PRINTER" THEN PR# 1; PRINT CHR$ (HEXVLU);; PR# 0
320 IF DIGIT% = 1 AND OUTFILE$ < > "PRINTER" THEN PRINT CHR$ (HEXVLU);
330 IF (DIGIT% < > 1 AND DIGIT% < > 2) AND OUTFILE$ = "PRINTER" THEN PR# 1;
      PRINT B$;; PR# 0
340 IF (DIGIT% < > 1 AND DIGIT% < > 2) AND OUTFILE$ < > "PRINTER" THEN
      PRINT CHR$ B$;
350 RETURN

500 REM ERROR CHECKING FOR END OF FILE (EC=5). IF IT'S NOT THE END OF FILE
      (EOF) THEN DISPLAY THE ERROR MESSAGE
505 EC = PEEK (222)
510 IF EC = 5 THEN PRINT D$;"CLOSE";INFILE#; END
520 POKE 216,0
530 RESUME

600 REM CONVERT THE CHARACTER IN B$ TO THE HEXADECIMAL EQUIVALENT
603 VALUE% = 0
605 FOR COUNT = 1 TO LEN (HEX$)
610 IF B$ = MID$ (HEX$,COUNT,1) THEN VALUE% = COUNT
620 NEXT COUNT
630 RETURN

700 REM OPEN INFILE# AND SET TO READ MODE
705 PRINT D$;"OPEN";INFILE#
710 PRINT D$;"READ";INFILE#
720 RETURN

```

```
PLEASE SELECT A NUMBER =>1
-----
PRESS: 'RETURN' TO ACCEPT
      'ESC' TO EXIT PROGRAM
```

- Option 1 lets you load graphic images from a DOS 3.3 disk in the current drive.
A catalog of the disk's directory is displayed. Choose the image to load into memory by typing the full name of the file and pressing **(RETURN)**.
- Option 2 lets you specify which drive you want to use. You are first asked to name the drive number, and then the slot number. Default values are drive 1 and slot 6.
- Option 3 displays a catalog of the contents of the disk in the current drive.
- Options 4-6 let you choose one of the demonstration pictures stored on the Imagewriter Tool Kit disk.

The second main menu option, **SHOW GRAPHICS IMAGE**, displays on the screen whatever is currently in the high-resolution graphics page in memory. If you haven't loaded a picture, the display will be a random hash. You can print this, using main menu option 4, but it really won't be very interesting.

The third main menu option, **CHANGE PRINT OPTION**, brings up the following display.

```
APPLE IMAGEWRITER TOOL KIT      V1.00A
(C) 1983 APPLE COMPUTER INC.
-----

      SELECT PRINT OPTION

      1 - SINGLE SIZE, NORMAL
      2 - SINGLE SIZE, INVERSE
      3 - DOUBLE SIZE, NORMAL
      4 - DOUBLE SIZE, INVERSE

PLEASE SELECT A NUMBER =>4
-----
PRESS: 'RETURN' TO ACCEPT
      'ESC' TO EXIT PROGRAM
```


The default condition is option 4. This is best suited to most graphics subjects. If your picture is a portrait, such as the Einstein image supplied with the Imagewriter Tool Kit, then option 3, double-size normal printing, would be better.

The other two printing options would be useful if you have narrow paper in your Imagewriter, or if you want to leave the right side of the paper free for printing something else such as text.

Main menu option 4, PRINT GRAPHIC IMAGE, will print whatever is in the graphics page of memory, assuming that the Imagewriter is on and connected.

Main menu option 5, DOWNLOAD SUPER/SUBSCRIPT FONTS lets you download an alternate character font to the Imagewriter, in this case a set of subscript and superscript characters. They can be used in any text printed by the Imagewriter by selecting the alternate character font, as described in Part I of this manual. The alternate character font remains in the Imagewriter's memory until either the printer is turned off or another character font is loaded.

Table 3-1 shows what the superscript and subscript character fonts look like and what key to press to get the character you want.

Table 3-1 Superscript and Subscript Characters

Superscript		Subscript	
Character	Results	Character	Results
A	A	a	A
B	B	b	B
C	C	c	C
D	D	d	D
E	E	e	E
F	F	f	F
G	G	g	G
H	H	h	H
I	I	i	I
J	J	j	J
K	K	k	K
L	L	l	L
M	M	m	M
N	N	n	N
O	O	o	O
P	P	p	P
Q	Q	q	Q
R	R	r	R
S	S	s	S
T	T	t	T
U	U	u	U
V	V	v	V
W	W	w	W
X	X	x	X
Y	Y	y	Y
Z	Z	z	Z

Superscript		Subscript	
Character	Results	Character	Results
!	¹	1	₁
"	²	2	₂
#	³	3	₃
\$	⁴	4	₄
%	⁵	5	₅
&	⁶	6	₆
'	⁷	7	₇
(⁸	8	₈
)	⁹	9	₉
@	⁰	0	₀
+	⁺	,	₊
=	⁻	-	₋
*	[*]	:	_*
?	[/]	?	_/
<	^{<}	,	_{<}
>	^{>}	.	_{>}

Here are two sample printings:



$$K_{sp} = [\text{Ca}^{2+}] [\text{F}^-]^2$$



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